

# CHA/IK/A 91÷151

**A CLASS ENERGY EFFICIENCY AIRCOOLED LIQUID CHILLERS AND HEAT PUMPS WITH AXIAL FANS, INVERTER SCROLL COMPRESSOR AND PLATE EXCHANGER.**



The liquid Chillers and Heat Pumps of the CHA/IK/A 91 ÷151 series, with R410A refrigerant, are designed to satisfy the needs of small and medium domestic and service sector environments. With a peraluman structure corrosion-resistant over time, these units can be combined with Fan Coil units or with intermediate heat exchangers for process cooling applications. All units feature A CLASS energy efficiency and are equipped with Inverter control on Scroll compressor for a better efficiency at partial loads (SEER/SCOP). The Microchannel condensing coil, available on the dedicated version, ensures an even higher efficiency (high EER), having a better heat exchange than traditional coils.

A wide range of accessories, factory fitted or supplied separately, complete the outstanding versatility and functionality of the series.

The Heat Pump version is designed for **hot water production up to 55 °C**.

**The units are compliant to the ErP Regulation.**

On request, units can be supplied with **R452B (CHA/IG/A 91÷151)** or **R454B (CHA/IL/A 91÷151)** refrigerant.



**INVERTER SCROLL**

**MICROCHANNEL**

## VERSION

CHA/IK/A	CHA/IK/A/MC	CHA/IK/A/WP
Cooling only	Cooling only with MICROCHANNEL condensing coil	Reversible Heat Pump

## FEATURES

- Structure with supporting frame, in peraluman and galvanized sheet.
- DC INVERTER Scroll compressor with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans with low ventilation and special wing profile, directly coupled to external rotor motors.
- Condenser made of copper tube and aluminum finned coils or aluminium MICROCHANNEL coils.
- Evaporator AISI 316 stainless steel braze welded plates type, complete with water differential pressure switch. On the Heat Pump units it is always installed an antifreeze heater.
- Electronic expansion valve.
- R410A refrigerant. On request R452B or R454B refrigerant.
- Electrical board includes: main switch with door lock device, fuses and pump remote control switch.
- Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C in cooling mode. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation and high and low pressure transducers on cooling circuit.
- Functioning in heating mode with outside air temperature down to -15 °C.
- Microprocessor control and regulation system.

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

BT	Low water temperature Kit
TX	Coil with pre-coated fins
TXB	Coil with epoxy treatment
PS	Single circulating pump
FE	Antifreeze heater for evaporator

### LOOSE ACCESSORIES

CR	Remote control panel
IS	Modbus RTU protocol, RS485 serial interface
RP	Coil protection metallic guards
AG	Rubber shock absorbers

MODEL			91	101	131	151
Cooling STD versions	Cooling capacity (1)	kW	25.8	30.5	35.9	42.3
	Absorbed power (1)	kW	8.0	9.5	11.3	13.4
	EER (1)		3.23	3.21	3.18	3.16
Cooling STD versions (EN14511)	Cooling capacity (1)	kW	25.6	30.3	35.7	42.1
	Absorbed power (1)	kW	8.1	9.7	11.5	13.6
	EER (1)		3.16	3.12	3.10	3.10
	SEER (2)		4.42	4.16	4.21	4.22
Cooling MC versions	Cooling capacity (1)	kW	25.8	30.5	35.9	42.3
	Absorbed power (1)	kW	7.9	9.4	11.2	13.3
Cooling MC versions (EN14511)	EER (1)		3.27	3.24	3.21	3.18
	Cooling capacity (1)	kW	25.6	30.3	35.7	42.1
	Absorbed power (1)	kW	8.0	9.6	11.4	13.5
	EER (1)		3.20	3.16	3.13	3.12
	SEER (2)		4.48	4.21	4.26	4.27
Heating STD versions	Heating capacity (3)	kW	28.7	34.3	40.4	48.0
	Absorbed power (3)	kW	8.1	9.9	11.8	14.0
Heating STD versions (EN14511)	COP (3)		3.54	3.46	3.42	3.43
	Heating capacity (3)	kW	28.9	34.5	40.7	48.3
	Absorbed power (3)	kW	8.3	10.1	12.0	14.3
	COP (3)		3.48	3.42	3.39	3.38
	SCOP (4)		3.34	3.23	3.33	3.41
	Energy Efficiency (4)	%	131	126	130	133
Compressor	Quantity	n°	1	1	1	1
	Water flow	l/s	1.23	1.46	1.72	2.02
Evaporator	Pressure drops	kPa	20	29	31	31
	Water connections	"G	1 ¼"	1 ¼"	1 ¼"	1 ¼"
	Power supply	V/Ph/Hz	400/3+N/50			
Electrical characteristics	Max. running current	A	21	24	27	34
	Max. starting current	A	11	14	15	18
	Pump available static pressure	kPa	140	115	150	105
Unit with pump	Water connections	"G	1 ¼"	1 ¼"	1 ¼"	1 ¼"
	STD versions (6)	dB(A)	60	61	62	62
Sound pressure	MC versions (6)	dB(A)	59	60	61	61
	Transport weight	Kg	224	239	269	283
Weights	Operating weight	Kg	229	244	275	289

DIMENSIONS			91	101	131	151
L	STD/MC	mm	1850	1850	1850	1850
W	STD/MC	mm	1000	1000	1000	1000
H	STD/MC	mm	1300	1300	1300	1300

## CLEARANCE AREA

CHA/IK/A 91÷151

500 | 800 | 800 | 800



## NOTES

- Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
  - Seasonal energy efficiency of cooling at low temperature. According to EU Regulation n. 2016/2281.
  - Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
  - Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
  - Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
  - Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
- N.B. Data of MC version are specified on technical brochure.  
N.B. Weights of WP version are specified on technical brochure.

FROM 28 KW TO 43 KW.

# CHA/K/FC 91÷151

**AIRCOOLED LIQUID CHILLERS FREE-COOLING WITH AXIAL FANS, SCROLL COMPRESSOR AND PLATE EXCHANGER.**



The liquid Chillers of the CHA/K/FC 91 ÷ 151 series, with R410A refrigerant, offer innovative technology to meet the needs of systems for both domestic as well as industrial applications requiring the production of cooled water continuously year-round.

During the cold months, in the **FREE-COOLING** operation mode, the return liquid of the system is cooled directly by forced convection of outdoor air through the condensing coil, thus saving energy by not operating the unit's Scroll compressors. A 3-way valve system is controlled by the electronic microprocessor controller, allowing functioning in CHILLER, FREE-COOLING or MIXED (simultaneously CHILLER and FREE-COOLING) modes.

**The units are compliant to the ErP 2021 Regulation for process cooling application.**



**FREE COOLING**

## VERSION

**CHA/K/FC**

Cooling only

**CHA/K/FC/SP**

Cooling only with tank and pump

## FEATURES

- Self-supporting galvanized steel frame protected with additional protection achieved via polyester powder painting.
- Scroll compressors with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans with low ventilation and special wing profile, directly coupled to external rotor motors.
- Condenser made of copper tubes and aluminium finned coil combined with FREE-COOLING copper tubes and aluminium finned coil.
- Evaporator AISI 316 stainless steel braze welded plates type, complete with water differential pressure switch.
- R410A refrigerant.
- Electrical board includes: main switch with door lock device, fuses, compressor and pump remote control switch.
- Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation, an high pressure transducer on cooling circuit and an electrical heater on electrical board.
- Water circuit for SP version includes: insulated tank, circulating pump, safety valve, gauge and expansion vessel.
- Microprocessor control and regulation system.

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

- BT Low water temperature Kit
- TX Coil with pre-coated fins
- PS Single circulating pump

### LOOSE ACCESSORIES

- CR Remote control panel
- IS Modbus RTU protocol, RS485 serial interface
- RP Coil protection metallic guards
- AG Rubber shock absorbers

MODEL			91	101	131	151
Cooling	Cooling capacity (1)	kW	27.9	31.4	37.3	42.8
	Absorbed power (1)	kW	9.5	11.0	13.9	15.6
	EER (1)		2.94	2.85	2.68	2.74
Cooling (EN14511)	Cooling capacity (1)	kW	27.5	30.9	36.7	42.1
	Absorbed power (1)	kW	9.9	11.5	14.5	16.3
	EER (1)		2.78	2.69	2.53	2.58
	SEPR (2)		5.61	5.62	5.21	5.22
Free-Cooling cycle	Air temperature (3)	°C	-1.7	-2.7	0.5	-1.2
	Absorbed power (3)	kW	0.98	0.98	1.96	1.96
Compressor	Quantity	n°	1	1	1	1
	Water flow	l/s	1.55	1.74	2.07	2.37
Water circuit	Pressure drops	kPa	117	142	132	141
	Water connections	"G	1"	1"	1"	1"
	Power supply	V/Ph/Hz	400/3+N/50			
Electrical characteristics	Max. running current	A	20	22	29	32
	Max. starting current	A	144	144	162	201
	Water flow	l/s	1.55	1.74	2.07	2.37
Unit SP version	Pump available static pressure	kPa	109	152	150	129
	Tank water volume	l	100	100	100	100
	Water connections	"G	1"	1"	1"	1"
	STD/SP version (4)	dB(A)	60	61	61	61
Sound pressure	Transport weight (5)	Kg	415	430	470	485
	Operating weight (5)	Kg	437	452	499	515

DIMENSIONS			91	101	131	151
L	STD/SP	mm	1850	1850	1850	1850
W	STD/SP	mm	900	900	900	900
H	STD/SP	mm	1840	1840	1840	1840

## CLEARANCE AREA

CHA/K/FC 91÷151

500	800	800	800
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## NOTES

1. Chilled water (with ethylene glycol at 30%) from 15 to 10 °C, ambient air temperature 35 °C.
2. Seasonal energy efficiency of process cooling at high temperature. According to EU Regulation n. 2016/2281.
3. Ambient air temperature at which the cooling capacity indicated in point (1) is reached.
4. Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
5. Unit without tank and pump.

# CHA/IK/A 172-P÷574-P

**A CLASS ENERGY EFFICIENCY AIRCOOLED LIQUID CHILLERS AND HEAT PUMPS WITH AXIAL FANS, INVERTER SCROLL COMPRESSORS AND PLATE EXCHANGER.**

**NEW**



The A CLASS energy efficiency liquid Chillers and Heat Pumps of the CHA/IK/A 172-P÷574-P series, with R410A refrigerant, are designed to satisfy the needs of medium-sized service sector or industrial ambients.

They are used, combined with Fan Coil units, for the air conditioning or heating of the rooms or to remove the heat developed during industrial processes.

They are equipped with axial fans, Inverter Scroll compressors and plate exchanger, even in the super silent version. All units feature A CLASS energy efficiency and are equipped with Inverter control on Scroll compressor for a better efficiency at partial loads (SEER/SCOP). The Microchannel condensing coils, available on dedicated versions, ensure an even higher efficiency (high EER), having a better heat exchange than traditional coils. Furthermore, Inverter control is also available on circulating pump and fans (EC Inverter) for a further efficiency improvement. A wide range of accessories, factory fitted or supplied separately, complete the outstanding versatility and functionality of the series.

Are available as option the new **EC Inverter fans with high available static pressure and efficiency for indoor ducted installation.**

The Heat Pump versions are designed for **hot water production up to 55 °C.**

**The units are compliant to the ErP Regulation.**

On request, units can be supplied with **R452B (CHA/IG/A 172-P÷574-P)** or **R454B (CHA/IL/A 172-P÷574-P)** refrigerant.



**INVERTER SCROLL**

**MICROCHANNEL**

## VERSION

CHA/IK/A	CHA/IK/A/MC	CHA/IK/A/WP
Cooling only	Cooling only with MICROCHANNEL condensing coil	Reversible Heat Pump
CHA/IK/A/SSL	CHA/IK/A/MC/SSL	CHA/IK/A/WP/SSL
Super silenced cooling only	Super silenced cooling only with MICROCHANNEL condensing coil	Super silenced reversible Heat Pump

## FEATURES

- Self-supporting galvanized steel frame protected with additional protection achieved via polyester powder painting.
- DC INVERTER Scroll and ON-OFF Scroll compressors with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans directly coupled to an electric motor with external rotor.
- Condenser made of copper tube and aluminum finned coil or aluminium MICROCHANNEL coil.
- Evaporator AISI 316 stainless steel braze welded plates type with one circuit on the refrigerant side and one on the water side in 172-P÷372-P models; with two independent circuits on the refrigerant side and one on the water side in 484-P÷574-P models, complete with water differential pressure switch. On the Heat Pump units it is always installed an antifreeze heater.
- Electronic expansion valve.
- Electronic high and low pressure gauges.
- R410A refrigerant. On request R452B or R454B refrigerant.
- Electrical board includes: main switch with door safety interlock, fuses, thermal protection relays for compressors and thermocontacts for fans.
- Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C in cooling mode. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation, high and low pressure transducers on cooling circuit and an electrical heater on electrical board.
- Functioning in heating mode with outside air temperature down to -15 °C.
- Microprocessor control and regulation system.

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

IM	Automatic circuit breakers	RT	Total heat recovery	ISBT	BACnet TCP/IP protocol, Ethernet port
SL	Unit silencement	TX	Coil with pre-coated fins	ISL	LonWorks protocol, FTT-10 serial interface
RFM	Cooling circuit shut-off valve on discharge line	TXB	Coil with epoxy treatment	ISS	SNMP protocol, Ethernet port
RFL	Cooling circuit shut-off valve on liquid line	PS	Single circulating pump		
BT	Low water temperature Kit	PSI	Inverter single circulating pump		
EC	EC Inverter fans	PD	Double circulating pump		
ECH	EC Inverter fans with high available static pressure	PDI	Inverter double circulating pump		
DS	Desuperheater	FE	Antifreeze heater for evaporator		
		IS	Modbus RTU protocol, RS485 serial interface		
		IST	Modbus TCP/IP protocol, Ethernet port		
		ISB	BACnet MSTP protocol, RS485 serial interface		

### LOOSE ACCESSORIES

MN	High and low pressure gauges
CR	Remote control panel
RP	Coil protection metallic guards
AG	Rubber shock absorbers
AM	Spring shock absorbers

MODEL			172-P	192-P	212-P	232-P	272-P	302-P	352-P	372-P	484-P	574-P
Cooling STD versions	Cooling capacity (1)	kW	49.9	57.7	65.7	74.8	85.9	97.7	112	130	152	179
	Absorbed power (1)	kW	15.6	18.1	20.4	23.6	27.0	30.3	35.0	40.5	47.2	55.6
	EER (1)		3.20	3.19	3.22	3.17	3.18	3.22	3.20	3.21	3.22	3.22
Cooling STD versions (EN14511)	Cooling capacity (1)	kW	49.6	57.4	65.4	74.4	85.4	97.2	112	129	151	178
	Absorbed power (1)	kW	15.9	18.4	20.7	24.0	27.5	30.8	35.6	41.1	47.8	56.2
	EER (1)		3.12	3.12	3.16	3.10	3.11	3.16	3.15	3.14	3.16	3.17
	SEER (2)		4.41	4.55	4.41	4.39	4.42	4.43	4.49	4.39	4.40	4.34
Cooling MC versions	Cooling capacity (1)	kW	49.9	57.7	65.7	74.8	85.9	97.7	112	130	152	179
	Absorbed power (1)	kW	15.4	17.9	20.2	23.4	26.7	30.0	34.7	40.1	46.7	55.0
	EER (1)		3.24	3.22	3.25	3.20	3.22	3.26	3.23	3.24	3.25	3.25
	SEER (2)		4.45	4.60	4.45	4.43	4.46	4.47	4.53	4.43	4.44	4.38
Cooling MC versions (EN14511)	Cooling capacity (1)	kW	49.6	57.4	65.4	74.4	85.4	97.2	112	129	151	178
	Absorbed power (1)	kW	15.7	18.2	20.5	23.8	27.2	30.5	35.2	40.7	47.3	55.6
	EER (1)		3.16	3.15	3.19	3.13	3.14	3.19	3.18	3.17	3.19	3.20
	SEER (2)		4.45	4.60	4.45	4.43	4.46	4.47	4.53	4.43	4.44	4.38
Heating STD versions	Heating capacity (3)	kW	53.7	62.2	71.0	80.7	92.6	105	121	140	164	193
	Absorbed power (3)	kW	16.2	18.7	21.2	24.5	28.0	31.4	36.4	41.8	49.0	57.7
	COP (3)		3.31	3.33	3.35	3.29	3.31	3.34	3.32	3.35	3.35	3.34
	SEER (2)		4.41	4.55	4.41	4.39	4.42	4.43	4.49	4.39	4.40	4.34
Heating STD versions (EN14511)	Heating capacity (3)	kW	54.1	62.6	71.4	81.2	93.2	106	122	141	165	194
	Absorbed power (3)	kW	16.6	19.2	21.6	25.1	28.8	32.2	37.2	43.0	50.0	58.8
	COP (3)		3.26	3.26	3.31	3.24	3.24	3.30	3.28	3.27	3.30	3.30
	SCOP (4)		3.47	3.43	3.42	3.58	3.60	3.46	3.52	3.49	3.44	3.43
	Energy Efficiency (4)	%	136	134	134	140	141	135	138	137	135	134
Compressor	Quantity	n°	2	2	2	2	2	2	2	2	4	4
	Refrigerant circuits	n°	1	1	1	1	1	1	1	1	2	2
	Capacity steps	n°	Stepless									
Evaporator	Water flow	l/s	2.38	2.76	3.14	3.57	4.10	4.67	5.35	6.21	7.26	8.55
	Pressure drops	kPa	41	40	32	39	47	40	35	44	33	30
	Water connections	"G	1 1/2"	1 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
Electrical characteristics	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	45	45	54	54	63	69	89	89	112	129
	Max. starting current	A	128	128	176	176	187	237	230	230	245	297
Unit with pump	Pump available static pressure	kPa	140	135	140	125	130	180	175	160	160	145
	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
ECH fan available static pressure	STD versions	Pa	70	60	100	80	75	80	80	80	75	65
	SSL versions	Pa	70	60	95	90	80	80	80	80	---	---
	MC versions	Pa	60	65	95	80	80	75	75	75	75	75
	MC/SSL versions	Pa	60	65	95	80	80	75	75	75	---	---
Sound pressure	STD versions (6)	dB(A)	63	65	66	66	67	68	68	69	68	68
	STD versions with SL accessory (6)	dB(A)	61	62	64	64	65	66	66	67	66	66
	SSL versions (6)	dB(A)	58	60	61	61	62	62	62	63	---	---
	MC versions (6)	dB(A)	62	64	65	65	66	67	67	68	67	67
	MC versions with SL accessory (6)	dB(A)	60	61	63	63	64	65	65	66	65	65
Weights	MC/SSL versions (6)	dB(A)	57	59	60	60	61	61	62	---	---	---
	Transport weight	Kg	614	688	747	756	765	857	1086	1095	1449	1494
Weights	Operating weight	Kg	620	695	755	765	775	870	1100	1110	1470	1520

DIMENSIONS			172-P	192-P	212-P	232-P	272-P	302-P	352-P	372-P	484-P	574-P
L	STD-MC	mm	2350	2350	2350	2350	2350	3550	3550	3550	4700	4700
	SSL-MC/SSL	mm	2350	2350	2350	3550	3550	3550	4700	4700	---	---
W	STD-SSL-MC-MC/SSL	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
H	STD-MC	mm	1920	2220	2220	2220	2220	1920	2220	2220	2220	2220
	SSL-MC/SSL	mm	1920	2220	2220	1920	1920	2220	2220	2220	---	---

CLEARANCE AREA

CHA/IK/A 172-P÷574-P

300 | 800 | 800 | 1800



NOTES

- Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
  - Seasonal energy efficiency of cooling at low temperature. According to EU Regulation n. 2016/2281.
  - Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
  - Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
  - Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
  - Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
- N.B. Weights of SSL and WP versions are specified on technical brochure.
- N.B. Data of MC versions are specified on technical brochure.



# CHA/K/AF 182-P÷604-P

**A CLASS ENERGY EFFICIENCY AIRCOOLED LIQUID CHILLERS AND HEAT PUMPS WITH AXIAL FANS, SCROLL COMPRESSORS AND PLATE EXCHANGER.**



The liquid Chillers and Heat Pumps of the CHA/K/AF 182-P÷604-P series, with R410A refrigerant, are designed for medium-sized service sector or industrial ambients and feature A CLASS energy efficiency.

They are used, combined with Fan Coil units, for the air conditioning or heating of the rooms or to remove the heat developed during industrial processes.

Equipped with axial fans, Scroll compressors and plate exchanger, even in the super silent version, these units can be completed by a hydraulic circuit with tank, with pump, with tank and pump or with AQUALOGIK technology.

The AQUALOGIK smart control system optimises the water set point and modulates the power supply voltage of the pump and the fans, thus making the use of the inertial tank superfluous. This obtains high energy efficiency, quiet operation and optimised dimensions and costs.

A wide range of accessories, factory fitted or supplied separately, complete the outstanding versatility and functionality of the series.

Are available as option the new **EC Inverter fans with high available static pressure and efficiency for indoor ducted installation.**

The Heat Pump versions are designed for **hot water production up to 55 °C.**

**The units are compliant to the ErP Regulation.**

On request, units can be supplied with **R452B (CHA/G/AF 182-P÷604-P)** or **R454B (CHA/L/AF 182-P÷604-P)** refrigerant.



## VERSION

CHA/K/AF	CHA/K/AF/WP	CHA/K/AF/SSL
Cooling only	Reversible Heat Pump	Super silenced cooling only
CHA/K/AF/WP/SSL	CHA/K/AF/ST	CHA/K/AF/WP/ST
Super silenced reversible Heat Pump	Cooling only with AQUALOGIK technology	Reversible Heat Pump with AQUALOGIK technology
CHA/K/AF/SSL/ST	CHA/K/AF/WP/SSL/ST	
Super silenced cooling only with AQUALOGIK technology	Super silenced reversible Heat Pump with AQUALOGIK technology	

## FEATURES

- Self-supporting galvanized steel frame protected with additional protection achieved via polyester powder painting.
- Scroll compressors with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans directly coupled to an electric motor with external rotor.
- Condenser made of copper tubes and aluminium finned coil.
- Evaporator AISI 316 stainless steel braze welded plates type with one circuit on the refrigerant side and one on the water side in 182-P÷453-P models; with two independent circuits on the refrigerant side and one on the water side in 524-P÷604-P models, complete with water differential pressure switch. On the Heat Pump units it is always installed an antifreeze heater.
- R410A refrigerant. On request R452B or R454B refrigerant.
- Electrical board includes: main switch with door safety interlock, fuses, thermal protection relays for compressors and thermocontacts for fans.
- On ST versions water circuit includes: INVERTER circulating pump, safety valve and expansion vessel.
- On ST versions Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C in cooling mode. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation, an high/low pressure transducer on cooling circuit and an electrical heater on electrical board.
- Functioning in heating mode with outside air temperature down to -15 °C.
- Microprocessor control and regulation system (with AQUALOGIK technology on ST versions).

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

IM	Automatic circuit breakers
SL	Unit silencement
RFM	Cooling circuit shut-off valve on discharge line
RFL	Cooling circuit shut-off valve on liquid line
CT	Condensing control down to 0 °C
CC	Condensing control down to -20 °C

BT	Low water temperature Kit
EC	EC Inverter fans
ECH	EC Inverter fans with high available static pressure
DS	Desuperheater
RT	Total heat recovery
TX	Coil with pre-coated fins
SI	Inertial tank
PS	Single circulating pump
PD	Double circulating pump
FE	Antifreeze heater for evaporator

FA	Antifreeze heater for tank
SS	Soft start
IS	Modbus RTU protocol, RS485 serial interface

### LOOSE ACCESSORIES

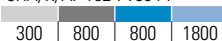
MN	High and low pressure gauges
CR	Remote control panel
RP	Coil protection metallic guards
AG	Rubber shock absorbers
AM	Spring shock absorbers

MODEL			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P	
Cooling	Cooling capacity (1)	kW	51.1	59.1	67.2	76.6	87.9	100	115	133	156	183	
	Absorbed power (1)	kW	16.0	18.5	20.9	24.2	27.6	31.0	35.8	41.5	48.3	56.9	
	EER (1)		3.19	3.19	3.22	3.17	3.18	3.23	3.21	3.20	3.23	3.22	
Cooling (EN14511)	Cooling capacity (1)	kW	50.8	58.7	66.9	76.2	87.4	99.5	114	132	155	182	
	Absorbed power (1)	kW	16.3	18.9	21.2	24.6	28.1	31.5	36.3	42.2	48.9	57.5	
	EER (1)		3.12	3.11	3.16	3.10	3.11	3.16	3.14	3.13	3.17	3.17	
	SEER (2)		4.17	4.21	4.20	4.19	4.19	4.22	4.25	4.16	4.16	4.18	
	Energy Efficiency (2)	%	164	165	165	165	165	166	167	163	163	164	
Heating	Heating capacity (3)	kW	55.4	64.1	72.9	83.1	95.3	109	124	144	169	198	
	Absorbed power (3)	kW	16.8	19.4	22.0	25.4	28.8	32.5	37.7	43.4	51.0	59.7	
	COP (3)		3.30	3.30	3.31	3.27	3.31	3.35	3.29	3.32	3.31	3.32	
Heating (EN14511)	Heating capacity (3)	kW	55.8	64.5	73.3	83.6	95.9	110	125	145	170	199	
	Absorbed power (3)	kW	17.3	19.9	22.5	26.1	29.7	33.4	38.6	44.7	52.1	61.2	
	COP (3)		3.23	3.24	3.26	3.20	3.23	3.29	3.24	3.24	3.26	3.25	
	SCOP (4)		3.36	3.32	3.31	3.43	3.45	3.35	3.37	3.34	3.33	3.32	
	Energy Efficiency (4)	%	131	130	129	134	135	131	132	131	130	130	
	Energy Class (5)		A+	A+	A+	A+	-	-	-	-	-	-	
Compressor	Quantity	n°	2	2	2	2	2	3	3	3	4	4	
	Refrigerant circuits	n°	1	1	1	1	1	1	1	1	2	2	
	Capacity steps	n°	2				3				4		
Evaporator	Water flow	l/s	2.44	2.82	3.21	3.66	4.20	4.78	5.49	6.35	7.45	8.74	
	Pressure drops	kPa	43	42	33	41	49	42	37	46	35	31	
	Water connections	"G	1 1/2"	1 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	
Electrical characteristics	Power supply	V/Ph/Hz	400/3/50										
	Max. running current	A	38	44	51	57	68	73	85	102	113	136	
	Max. starting current	A	132	142	148	172	212	169	200	246	229	280	
Electrical characteristics (ST versions)	Power supply	V/Ph/Hz	400/3/50										
	Max. running current	A	42	48	54	60	71	78	90	106	118	140	
	Max. starting current	A	135	145	152	176	215	173	204	250	233	284	
Unit with tank and pump	Pump available static pressure	kPa	140	135	135	120	125	175	175	155	155	140	
	Tank water volume	l	400	400	400	400	400	400	400	400	600	600	
	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	
Unit ST versions	Water flow	l/s	2.44	2.82	3.21	3.66	4.20	4.78	5.49	6.35	7.45	8.74	
	Pump available static pressure	kPa	135	130	135	115	100	140	140	125	125	115	
	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	
ECH fan available static pressure	STD versions	Pa	70	60	100	80	75	80	80	80	75	65	
	SSL versions	Pa	70	60	95	90	80	80	80	80	---	---	
	ST versions	Pa	70	60	100	80	75	80	80	80	75	65	
	SSL/ST versions	Pa	70	60	95	90	80	80	80	80	---	---	
Sound pressure	STD and ST versions (6)	dB(A)	63	63	66	66	66	66	67	68	68	68	
	With SL accessory (6)	dB(A)	61	61	64	64	64	64	65	66	66	66	
	SSL and SSL/ST versions (6)	dB(A)	58	58	61	61	61	61	61	61	---	---	
Weights	Transport weight (7)	Kg	574	606	625	679	728	836	973	1015	1305	1367	
	Operating weight (7)	Kg	578	610	630	685	734	843	982	1024	1320	1387	
Weights (ST versions)	Transport weight	Kg	589	621	640	694	743	856	993	1035	1325	1387	
	Operating weight	Kg	593	625	645	700	749	863	1002	1044	1340	1407	

DIMENSIONS			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
L	STD-ST	mm	2350	2350	2350	2350	2350	3550	3550	3550	4700	4700
	SSL-SSL/ST	mm	2350	2350	2350	3550	3550	3550	4700	4700	--	--
W	STD-SSL-ST-SSL/ST	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
H	STD-ST	mm	1920	2220	2220	2220	2220	1920	2220	2220	2220	2220
	SSL-SSL/ST	mm	1920	2220	2220	1920	1920	2220	2220	2220	--	--

CLEARANCE AREA

CHA/K/AF 182-P÷604-P



NOTES

- Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
- Seasonal energy efficiency of cooling at low temperature. According to EU Regulation n. 2016/2281.
- Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
- Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
- Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
- Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
- Unit without tank and pump.
- N.B. Weights of SSL and WP versions are specified on technical brochure.



# CHA/K/A/WP 182-P÷604-P

**A CLASS ENERGY EFFICIENCY AIRCOOLED REVERSIBLE HEAT PUMPS WITH AXIAL FANS, SCROLL COMPRESSORS AND PLATE EXCHANGER.**



The reversible Heat Pumps of the CHA/K/A/WP 182-P÷604-P series, with R410A refrigerant, are designed for medium-sized service sector or industrial ambients and feature A CLASS energy efficiency.

They are used, combined with Fan Coil units, for the heating or air conditioning of the rooms and are supplied with Modbus RTU protocol through RS485 serial interface.

Equipped with axial fans, Scroll compressors and plate exchanger, even in the super silent version, these units can be completed by a hydraulic circuit with tank, with pump, with tank and pump or with AQUALOGIK technology.

The AQUALOGIK smart control system optimises the water set point and modulates the power supply voltage of the pump and the fans, thus making the use of the inertial tank superfluous. This obtains high energy efficiency, quiet operation and optimised dimensions and costs.

A wide range of accessories, factory fitted or supplied separately, complete the outstanding versatility and functionality of the series.

Are available as option the new **EC Inverter fans with high available static pressure and efficiency for indoor ducted installation.**

Units are designed for **hot water production up to 55 °C.**

**The units are compliant to the ErP Regulation.**

On request, units can be supplied with **R452B (CHA/G/A/WP 182-P÷604-P)** or **R454B (CHA/L/A/WP 182-P÷604-P)** refrigerant.



## VERSION

### CHA/K/A/WP

Reversible Heat Pump

### CHA/K/A/WP/SSL

Super silenced reversible Heat Pump

### CHA/K/A/WP/ST

Reversible Heat Pump with AQUALOGIK technology

### CHA/K/A/WP/SSL/ST

Super silenced reversible Heat Pump with AQUALOGIK technology

## FEATURES

- Self-supporting galvanized steel frame protected with additional protection achieved via polyester powder painting.
- Scroll compressors with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans directly coupled to an electric motor with external rotor.
- Condenser made of copper tubes and aluminium finned coil.
- Evaporator AISI 316 stainless steel braze welded plates type with one circuit on the refrigerant side and one on the water side in 182-P÷453-P models; with two independent circuits on the refrigerant side and one on the water side in 524-P÷604-P models, complete with water differential pressure switch. On the units it is always installed an antifreeze heater.
- R410A refrigerant. On request R452B or R454B refrigerant
- Electrical board includes: main switch with door safety interlock, fuses, thermal protection relays for compressors and thermocontacts for fans.
- On ST versions water circuit includes: INVERTER circulating pump, safety valve and expansion vessel.
- On ST versions Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C in cooling mode. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation, an high/low pressure transducer on cooling circuit and an electrical heater on electrical board.
- Functioning in heating mode with outside air temperature down to -15 °C.
- Microprocessor control and regulation system (with AQUALOGIK technology on ST versions).

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

IM	Automatic circuit breakers
SL	Unit silencing
RFM	Cooling circuit shut-off valve on discharge line
RFL	Cooling circuit shut-off valve on liquid line
CT	Condensing control down to 0 °C
CC	Condensing control down to -20 °C
BT	Low water temperature Kit

EC	EC Inverter fans
ECH	EC Inverter fans with high available static pressure
DS	Desuperheater
RT	Total heat recovery
TX	Coil with pre-coated fins
SI	Inertial tank
PS	Single circulating pump
PD	Double circulating pump
FA	Antifreeze heater for tank
SS	Soft start
IS	Modbus RTU protocol, RS485 serial interface

### LOOSE ACCESSORIES

MN	High and low pressure gauges
CR	Remote control panel
RP	Coil protection metallic guards
AG	Rubber shock absorbers
AM	Spring shock absorbers

MODEL			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
Heating	Heating capacity (1)	kW	55.7	63.6	71.4	81.6	94.2	109	124	142	163	197
	Absorbed power (1)	kW	16.9	19.5	21.8	24.4	28.2	33.3	37.2	43.2	49.9	59.0
	COP (1)		3.30	3.26	3.28	3.34	3.34	3.27	3.33	3.29	3.27	3.34
Heating (EN14511)	Heating capacity (1)	kW	56.0	63.9	71.7	81.9	94.6	109	124	143	164	198
	Absorbed power (1)	kW	17.1	19.8	22.2	24.8	28.6	33.7	37.8	44.1	50.9	60.2
	COP (1)		3.27	3.23	3.23	3.30	3.31	3.23	3.28	3.24	3.22	3.29
	SCOP (2)		3.43	3.39	3.38	3.50	3.52	3.42	3.44	3.41	3.40	3.39
	Energy Efficiency (2)	%	134	133	132	137	138	134	135	133	133	133
	Energy Class (3)		A+	A+	A+	A+	-	-	-	-	-	-
Cooling	Cooling capacity (4)	kW	48.2	54.9	62.5	71.9	82.3	94.5	108	125	139	161
	Absorbed power (4)	kW	15.8	18.7	20.7	23.7	28.5	32.0	35.6	41.8	48.0	56.7
	EER (4)		3.05	2.94	3.02	3.03	2.89	2.95	3.03	2.99	2.90	2.84
Cooling (EN14511)	Cooling capacity (4)	kW	48.0	54.6	62.2	71.6	82.0	94.2	108	124	138	160
	Absorbed power (4)	kW	16.0	19.0	21.0	24.0	28.8	32.3	36.0	42.4	48.6	57.4
	EER (4)		3.00	2.87	2.96	2.98	2.85	2.92	3.00	2.92	2.84	2.79
Compressor	Quantity	n°	2	2	2	2	2	3	3	3	4	4
	Refrigerant circuits	n°	1	1	1	1	1	1	1	1	2	2
	Capacity steps	n°	2			3			4			
Evaporator	Water flow	l/s	2.30	2.62	2.99	3.44	3.93	4.52	5.16	5.97	6.64	7.69
	Pressure drops	kPa	28	30	31	28	28	23	29	39	38	37
	Water connections	"G	1 1/2"	1 1/2"	1 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
Electrical characteristics	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	35	41	48	54	65	72	81	102	109	132
	Max. starting current	A	130	140	144	169	209	169	197	246	225	276
Electrical characteristics (ST versions)	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	39	45	51	57	68	77	86	106	114	136
	Max. starting current	A	133	143	148	173	212	173	201	250	229	280
Unit with tank and pump	Pump available static pressure	kPa	155	150	140	135	150	195	185	165	160	150
	Tank water volume	l	400	400	400	400	400	400	400	400	600	600
	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
Unit ST versions	Water flow	l/s	2.30	2.62	2.99	3.44	3.93	4.52	5.16	5.97	6.64	7.69
	Pump available static pressure	kPa	155	145	140	135	125	165	150	135	130	120
	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
ECH fan available static pressure	STD versions	Pa	70	60	100	100	100	95	60	65	60	65
	SSL versions	Pa	70	60	65	60	60	95	60	60	60	60
	ST versions	Pa	70	60	100	100	100	95	60	65	60	65
	SSL/ST versions	Pa	70	60	65	60	60	95	60	60	60	60
Sound pressure	STD and ST versions (5)	dB(A)	62	62	65	65	65	66	68	68	69	70
	With SL accessory (5)	dB(A)	60	60	63	63	63	64	66	66	67	68
	SSL and SSL/ST versions (5)	dB(A)	58	58	61	61	60	60	63	63	64	66
Weights	Transport weight (6)	Kg	635	644	693	760	807	926	1076	1126	1235	1414
	Operating weight (6)	Kg	640	650	700	770	820	940	1090	1140	1250	1430
Weights (ST versions)	Transport weight	Kg	650	659	708	775	822	946	1096	1146	1255	1434
	Operating weight	Kg	655	665	715	785	830	960	1110	1160	1270	1450

DIMENSIONS			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
L	STD-ST	mm	2350	2350	2350	2350	2350	2350	3550	3550	3550	3550
	SSL-SSL/ST	mm	2350	2350	2350	2350	2350	3550	3550	4700	4700	4700
W	STD-SSL-ST-SSL/ST	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
H	STD-SSL-ST-SSL/ST	mm	1920	1920	1920	2220	2220	2220	2220	2220	2220	2220

CLEARANCE AREA

CHA/K/A/WP 182-P÷604-P

300 | 800 | 800 | 1800



NOTES

1. Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
  2. Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
  3. Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
  4. Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
  5. Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
  6. Unit without tank and pump.
- N.B. Weights of SSL versions are specified on technical brochure.

# CHA/K 182-P÷604-P

**AIRCOOLED LIQUID CHILLERS AND HEAT PUMPS WITH AXIAL FANS, SCROLL COMPRESSORS AND PLATE EXCHANGER.**



The liquid Chillers and Heat Pumps of the CHA/K 182-P÷604-P series, with R410A refrigerant, are designed for medium-sized service sector or industrial ambients. They are used, combined with Fan Coil units, for the air conditioning of the rooms or to remove the heat developed during industrial processes. They can be supplied with Modbus RTU protocol through RS485 serial interface.

Equipped with axial fans, Scroll compressors and plate exchanger, even in the super silent version, these units can be completed by a hydraulic circuit with tank, with pump, with tank and pump or with AQUALOGIK technology.

The AQUALOGIK smart control system optimises the water set point and modulates the power supply voltage of the pump and the fans, thus making the use of the inertial tank superfluous. This obtains high energy efficiency, quiet operation and optimised dimensions and costs.

A wide range of accessories, factory fitted or supplied separately, complete the outstanding versatility and functionality of the series.

Are available as option the new **EC Inverter fans with high available static pressure and efficiency for indoor ducted installation.**

**Cooling only units are compliant to the ErP 2021 Regulation for process cooling application; for comfort cooling application they are compliant if provided with EC or ECH accessory (EC Inverter fans).**

**Heat pump units are compliant to the ErP Regulation.**

On request, units can be supplied with **R452B (CHA/G 182-P÷604-P)** or **R454B (CHA/L 182-P÷604-P)** refrigerant.



## VERSION

CHA/K	CHA/K/WP	CHA/K/SSL
Cooling only	Reversible Heat Pump	Super silenced cooling only
CHA/K/WP/SSL	CHA/K/ST	CHA/K/WP/ST
Super silenced reversible Heat Pump	Cooling only with AQUALOGIK technology	Reversible Heat Pump with AQUALOGIK technology
CHA/K/SSL/ST	CHA/K/WP/SSL/ST	
Super silenced cooling only with AQUALOGIK technology	Super silenced reversible Heat Pump with AQUALOGIK technology	

## FEATURES

- Self-supporting galvanized steel frame protected with additional protection achieved via polyester powder painting.
- Scroll compressors with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans directly coupled to an electric motor with external rotor.
- Condenser made of copper tubes and aluminium finned coil.
- Evaporator AISI 316 stainless steel braze welded plates type with one circuit on the refrigerant side and one on the water side in 182-P÷453-P models; with two independent circuits on the refrigerant side and one on the water side in 524-P÷604-P models, complete with water differential pressure switch. On the Heat Pump units it is always installed an antifreeze heater.
- R410A refrigerant. On request R452B or R454B refrigerant.
- Electrical board includes: main switch with door safety interlock, fuses, thermal protection relays for compressors and thermocontacts for fans.
- On ST versions water circuit includes: INVERTER circulating pump, safety valve and expansion vessel.
- On ST versions Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C in cooling mode. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation, an high/low pressure transducer on cooling circuit and an electrical heater on electrical board.
- Microprocessor control and regulation system (with AQUALOGIK technology on ST versions).

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

IM	Automatic circuit breakers
SL	Unit silencement
RFM	Cooling circuit shut-off valve on discharge line
RFL	Cooling circuit shut-off valve on liquid line
CT	Condensing control down to 0 °C
CC	Condensing control down to -20 °C
BT	Low water temperature Kit

EC	EC Inverter fans
ECH	EC Inverter fans with high available static pressure
DS	Desuperheater
RT	Total heat recovery
TX	Coil with pre-coated fins
SI	Inertial tank
PS	Single circulating pump
PD	Double circulating pump
FE	Antifreeze heater for evaporator
FA	Antifreeze heater for tank

SS	Soft start
IS	Modbus RTU protocol, RS485 serial interface

### LOOSE ACCESSORIES

MN	High and low pressure gauges
CR	Remote control panel
RP	Coil protection metallic guards
AG	Rubber shock absorbers
AM	Spring shock absorbers

MODEL			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
Cooling	Cooling capacity (1)	kW	47.6	54.9	63.5	72.9	83.4	95.9	110	127	147	178
	Absorbed power (1)	kW	16.1	18.8	21.8	25.0	28.3	31.6	37.9	43.3	50.1	58.2
	EER (1)		2.96	2.92	2.91	2.92	2.95	3.03	2.90	2.93	2.93	3.06
Cooling (EN14511)	Cooling capacity (1)	kW	47.3	54.5	63.1	72.4	82.9	95.3	110	126	147	177
	Absorbed power (1)	kW	16.4	19.2	22.2	25.4	28.7	32.3	38.5	43.9	50.9	59.2
	EER (1)		2.88	2.84	2.84	2.85	2.89	2.95	2.85	2.87	2.88	2.99
	SEER (2)		3.93	3.95	3.99	3.96	3.95	3.93	3.92	3.98	3.91	3.92
	Energy Efficiency (2)	%	154	155	157	155	155	154	154	156	153	154
	SEER with EC or ECH accessory (2)		4.11	4.11	4.14	4.11	4.16	4.13	4.12	4.18	4.21	4.27
	Energy Efficiency with EC or ECH accessory (2)		161	161	163	161	163	162	162	164	165	168
Heating	Heating capacity (3)	kW	54.1	61.8	71.4	80.3	90.4	106	120	135	154	187
	Absorbed power (3)	kW	17.3	19.6	23.1	25.4	28.8	33.4	38.5	43.8	50.5	60.4
	COP (3)		3.13	3.15	3.09	3.16	3.14	3.16	3.12	3.08	3.06	3.10
Heating (EN14511)	Heating capacity (3)	kW	54.5	62.3	71.9	80.9	90.9	107	121	136	155	188
	Absorbed power (3)	kW	17.8	20.2	23.7	26.1	29.5	34.6	39.5	45.1	51.8	62.0
	COP (3)		3.06	3.08	3.03	3.10	3.08	3.09	3.06	3.02	2.99	3.03
	SCOP (4)		3.23	3.20	3.21	3.28	3.29	3.28	3.20	3.25	3.24	3.25
	Energy Efficiency (4)	%	126	125	125	128	129	128	125	127	127	127
Compressor	Energy Class (5)		A+	A+	A+	A+	-	-	-	-	-	-
	Quantity	n°	2	2	2	2	2	3	3	3	4	4
	Refrigerant circuits	n°	1	1	1	1	1	1	1	1	2	2
Evaporator	Capacity steps	n°	2					3			4	
	Water flow	l/s	2.27	2.62	3.03	3.48	3.98	4.58	5.27	6.06	7.04	8.49
	Pressure drops	kPa	45	48	43	48	43	58	46	53	48	48
Electrical characteristics	Water connections	"G	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	35	41	48	54	65	69	81	98	105	132
Electrical characteristics (ST versions)	Max. starting current	A	130	140	144	169	209	166	197	242	221	276
	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	39	45	51	57	68	73	86	102	110	136
Unit with tank and pump	Max. starting current	A	133	143	148	173	212	170	201	246	226	280
	Pump available static pressure	kPa	140	130	130	115	135	160	165	150	145	130
	Tank water volume	l	400	400	400	400	400	400	400	400	600	600
Unit ST versions	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	Water flow	l/s	2.27	2.62	3.03	3.48	3.98	4.58	5.27	6.06	7.04	8.49
	Pump available static pressure	kPa	135	130	125	115	110	130	135	120	115	100
ECH fan available static pressure	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	STD versions	Pa	90	80	100	100	100	80	95	75	60	60
	SSL versions	Pa	85	85	75	75	70	50	70	60	60	---
	ST versions	Pa	90	80	100	100	100	80	95	75	60	60
Sound pressure	SSL/ST versions	Pa	90	90	80	80	85	50	70	55	50	---
	STD and ST versions (6)	dB(A)	61	61	64	64	65	66	67	67	67	67
	With SL accessory (6)	dB(A)	59	59	62	62	63	64	65	65	65	65
	SSL and SSL/ST versions (6)	dB(A)	57	57	60	60	61	62	63	63	63	---
Weights	Transport weight (7)	Kg	595	624	663	682	791	878	927	1036	1135	1374
	Operating weight (7)	Kg	600	630	670	690	800	890	940	1050	1150	1390
Weights (ST versions)	Transport weight	Kg	610	639	678	697	806	898	947	1056	1155	1394
	Operating weight	Kg	615	645	685	705	815	910	960	1070	1170	1410

DIMENSIONS			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
L	STD-ST	mm	2350	2350	2350	2350	2350	2350	2350	2350	3550	3550
	SSL-SSL/ST	mm	2350	2350	2350	2350	2350	2350	3550	3550	3550	---
W	STD-SSL-ST-SSL/ST	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
H	STD-SSL-ST-SSL/ST	mm	1920	1920	1920	1920	2220	2220	2220	2220	2220	2220

CLEARANCE AREA

CHA/K 182-P÷604-P



NOTES

- Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
- Seasonal energy efficiency of cooling at low temperature. According to EU Regulation n. 2016/2281.
- Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
- Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
- Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
- Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
- Unit without tank and pump.
- N.B. Weights of SSL and WP versions are specified on technical brochure.

FROM 53 KW TO 174 KW.

# CHA/K/FC 182-P÷604-P

**AIRCOOLED LIQUID CHILLERS FREE-COOLING WITH AXIAL FANS, SCROLL COMPRESSORS AND PLATE EXCHANGER.**



The liquid Chillers of the CHA/K/FC 182-P÷604-P series, with R410A refrigerant, offer innovative technology for both domestic as well as industrial applications requiring the production of cooled water continuously year-round.

During the cold months, in the **FREE-COOLING** operation mode, the return liquid of the system is cooled directly by forced convection of outdoor air through the condensing coil, thus saving energy by not operating the unit's Scroll compressors. A 3-way valve system is controlled by the electronic microprocessor controller, allowing functioning in CHILLER, FREE-COOLING or MIXED (simultaneously CHILLER and FREE-COOLING) modes.

Are available as option the new **EC Inverter fans with high available static pressure and efficiency for ducted installation.**

**The units are compliant to the ErP 2021 Regulation for process cooling application.**

On request, units can be supplied with **R452B (CHA/G/FC 182-P÷604-P)** or **R454B (CHA/L/FC 182-P÷604-P)** refrigerant.



## VERSION

**CHA/K/FC**

Cooling only

## FEATURES

- Self-supporting galvanized steel frame protected with additional protection achieved via polyester powder painting.
- Scroll compressors with oil sight glass, internal overheat protection and crankcase heater.
- Axial fans directly coupled to an electric motor with external rotor.
- Condenser made of copper tubes and aluminium finned coil combined with FREE-COOLING coil.
- Evaporator AISI 316 stainless steel braze welded plates type with one circuit on the refrigerant side and one on the water side in 182-P÷453-P models; with two independent circuits on the refrigerant side and one on the water side in 524-P÷604-P models, complete with water differential pressure switch.
- Electronic high and low pressure gauges.
- R410A refrigerant. On request R452B or R454B refrigerant.
- Electrical board includes: main switch with door safety interlock, fuses, thermal protection relays for compressors and thermocontacts for fans.
- Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation, an high pressure transducer on cooling circuit and an electrical heater on electrical board.
- Microprocessor control and regulation system.

## ACCESSORIES

### FACTORY FITTED ACCESSORIES

IM	Automatic circuit breakers
SL	Unit silencing
RFM	Cooling circuit shut-off valve on discharge line
RFL	Cooling circuit shut-off valve on liquid line
BT	Low water temperature Kit
EC	EC Inverter fans
ECH	EC Inverter fans with high available static pressure
TX	Coil with pre-coated fins
SI	Inertial tank

PS	Single circulating pump
PD	Double circulating pump
SS	Soft start
IS	Modbus RTU protocol, RS485 serial interface
IST	Modbus TCP/IP protocol, Ethernet port
ISB	BACnet MSTP protocol, RS485 serial interface
ISBT	BACnet TCP/IP protocol, Ethernet port
ISL	LonWorks protocol, FTT-10 serial interface
ISS	SNMP protocol, Ethernet port

### LOOSE ACCESSORIES

MN	High and low pressure gauges
CR	Remote control panel
RP	Coil protection metallic guards
AG	Rubber shock absorbers
AM	Spring shock absorbers



# CHA/K/FC 182-P÷604-P

MODEL			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
Cooling	Cooling capacity (1)	kW	52.7	59.5	68.1	76.7	85.7	99.1	114	130	151	174
	Absorbed power (1)	kW	18.1	20.3	23.3	26.1	29.3	36.8	42.2	48.4	54.4	64.9
	EER (1)		2.91	2.93	2.92	2.94	2.92	2.69	2.70	2.69	2.78	2.68
Cooling (EN14511)	Cooling capacity (1)	kW	52.0	58.8	67.3	75.9	84.9	98.2	113	129	150	172
	Absorbed power (1)	kW	18.8	21.0	24.1	26.9	30.1	37.7	43.5	49.9	55.7	66.4
	EER (1)		2.77	2.80	2.79	2.82	2.82	2.60	2.60	2.59	2.69	2.59
Free-Cooling cycle	SERP (2)		5.11	5.13	5.12	5.14	5.12	5.11	5.09	5.08	5.15	5.14
	Air temperature (3)	°C	2.1	1.3	0.0	-2.4	-3.5	1.0	0.0	-1.1	-3.0	-4.8
	Absorbed power (3)	kW	2	2	2	2	2	6	6	6	8	8
Compressor	Quantity	n°	2	2	2	2	2	3	3	3	4	4
	Refrigerant circuits	n°	1	1	1	1	1	1	1	1	2	2
	Capacity steps	n°	2			3			4			
Water circuit	Water flow	l/s	2.72	3.07	3.52	3.96	4.43	5.09	5.88	6.70	7.78	8.93
	Pressure drops	kPa	115	105	120	100	100	100	135	145	102	106
	Water connections	"G	2"	2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
Electrical characteristics	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	35	41	48	54	65	76	85	102	113	136
	Max. starting current	A	130	140	144	169	209	173	201	246	229	280
Unit with tank and pump	Pump available static pressure	kPa	120	125	100	115	100	190	145	125	150	125
	Tank water volume	l	400	400	400	400	400	400	400	400	600	600
	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
ECH fan available static pressure	Pa	110	110	110	105	105	60	60	60	65	65	
Sound pressure	STD version (4)	dB(A)	63	63	63	63	64	65	66	66	67	67
	With SL accessory (4)	dB(A)	61	61	60	60	62	63	64	64	65	65
Weights	Transport weight (5)	Kg	923	932	951	980	999	1308	1317	1350	1472	1510
	Operating weight (5)	Kg	970	980	1000	1030	1050	1390	1400	1435	1560	1600

DIMENSIONS			182-P	202-P	242-P	262-P	302-P	363-P	393-P	453-P	524-P	604-P
L	STD	mm	3550	3550	3550	3550	3550	4700	4700	4700	4700	4700
W	STD	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
H	STD	mm	2220	2220	2220	2220	2220	2235	2235	2235	2235	2235

## CLEARANCE AREA

CHA/K/FC 182-P÷604-P

300 | 800 | 800 | 1800



## NOTES

- Chilled water (with ethylene glycol at 30%) from 15 to 10 °C, ambient air temperature 35 °C.
- Seasonal energy efficiency of process cooling at high temperature. According to EU Regulation n. 2016/2281.
- Ambient air temperature at which the cooling capacity indicated in point (1) is reached.
- Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
- Unit without tank and pump.



MODEL			182	202	242	262	302	363	393	453	524	604
Cooling	Cooling capacity (1)	kW	49.0	55.0	62.4	73.3	84.3	95.2	109	129	149	179
	Absorbed power (1)	kW	16.6	18.8	21.5	25.3	28.6	31.6	37.5	43.7	50.7	58.8
	EER (1)		2.95	2.93	2.90	2.90	2.95	3.01	2.91	2.95	2.94	3.04
Cooling (EN14511)	Cooling capacity (1)	kW	48.8	54.7	62.0	72.8	83.9	94.7	108	128	148	178
	Absorbed power (1)	kW	16.8	19.1	21.9	25.8	29.0	32.1	38.1	44.3	51.4	59.5
	EER (1)		2.90	2.86	2.83	2.82	2.89	2.95	2.83	2.89	2.88	2.99
	SEER (2)		3.95	3.97	3.91	3.92	3.98	3.98	3.86	3.98	4.01	4.02
	Energy Efficiency (2)	%	155	156	153	154	156	156	151	156	157	158
	SEER with EC or ECH accessory (2)		4.14	4.14	4.13	4.10	4.16	4.13	4.10	4.20	4.21	4.27
	Energy Efficiency with EC or ECH accessory (2)		163	163	162	161	163	162	161	165	165	168
Heating	Heating capacity (3)	kW	55.7	61.9	70.2	80.7	91.4	105	119	137	156	188
	Absorbed power (3)	kW	17.8	19.6	22.8	25.7	29.1	33.4	38.1	44.2	51.1	61.0
	COP (3)		3.13	3.16	3.08	3.14	3.14	3.14	3.12	3.10	3.05	3.08
Heating (EN14511)	Heating capacity (3)	kW	56.0	62.2	70.7	81.3	91.9	106	120	138	157	189
	Absorbed power (3)	kW	18.0	20.0	23.5	26.6	29.8	34.2	39.1	45.1	52.3	62.3
	COP (3)		3.11	3.11	3.01	3.06	3.08	3.10	3.07	3.06	3.00	3.03
	SCOP (4)		3.28	3.23	3.21	3.24	3.29	3.29	3.21	3.29	3.25	3.25
	Energy Efficiency (4)	%	128	126	125	127	129	129	125	129	127	127
Compressor	Energy Class (5)		A+	A+	A+	A+	-	-	-	-	-	-
	Quantity	n°	2	2	2	2	2	3	3	3	4	4
	Refrigerant circuits	n°	1	1	1	1	1	1	1	1	2	2
Evaporator	Capacity steps	n°	2					3			4	
	Water flow	l/s	2.31	2.60	2.95	3.46	3.98	4.50	5.15	6.09	7.04	8.45
	Pressure drops	kPa	22	29	50	55	40	39	45	36	43	38
Electrical characteristics	Water connections	"G	1 1/2"	1 1/2"	2"	2"	2 1/2"	2 1/2"	2 1/2"	3"	3"	3"
	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	35	41	48	54	65	69	81	98	105	132
Electrical characteristics (ST versions)	Max. starting current	A	130	140	144	169	209	166	197	242	221	276
	Power supply	V/Ph/Hz	400/3/50									
	Max. running current	A	39	45	51	57	68	73	86	102	110	136
Unit with tank and pump	Max. starting current	A	133	143	148	173	212	170	201	246	226	280
	Pump available static pressure	kPa	160	150	125	110	140	180	170	170	150	140
	Tank water volume	l	470	470	470	470	470	470	470	470	660	660
Unit ST versions	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	Water flow	l/s	2.31	2.60	2.95	3.46	3.98	4.50	5.15	6.09	7.04	8.45
	Pump available static pressure	kPa	160	150	120	105	110	145	135	140	120	110
ECH fan available static pressure	Water connections	"G	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
	STD versions	Pa	90	80	100	100	100	80	95	75	60	60
	SSL versions	Pa	85	85	75	75	70	50	70	60	60	---
	ST versions	Pa	90	80	100	100	100	80	95	75	60	60
Sound pressure	SSL/ST versions	Pa	90	90	80	80	85	50	70	55	50	---
	STD and ST versions (6)	dB(A)	61	61	64	64	65	66	67	67	67	67
	With SL accessory (6)	dB(A)	59	59	62	62	63	64	65	65	65	65
	SSL and SSL/ST versions (6)	dB(A)	57	57	60	60	61	62	63	63	63	---
Weights	Transport weight (7)	Kg	641	661	701	719	844	931	971	1112	1192	1428
	Operating weight (7)	Kg	660	680	720	740	870	960	1000	1150	1230	1470
Weights (ST versions)	Transport weight	Kg	655	675	715	735	860	950	990	1130	1210	1450
	Operating weight	Kg	660	690	730	750	875	970	1010	1150	1230	1470

DIMENSIONS			182	202	242	262	302	363	393	453	524	604
L	STD-ST	mm	2350	2350	2350	2350	2350	2350	2350	2350	3550	3550
	SSL-SSL/ST	mm	2350	2350	2350	2350	2350	2350	3550	3550	3550	---
W	STD-SSL-ST-SSL/ST	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
H	STD-SSL-ST-SSL/ST	mm	1920	1920	1920	1920	2220	2220	2220	2220	2220	2220

CLEARANCE AREA

CHA/K 182÷604



NOTES

- Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
- Seasonal energy efficiency of cooling at low temperature. According to EU Regulation n. 2016/2281.
- Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
- Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
- Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
- Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.
- Unit without tank and pump.
- N.B. Weights of SSL and WP versions are specified on technical brochure.

FROM 6,0 KW TO 36 KW.

## CRA/IK/A 21÷131

**A CLASS ENERGY EFFICIENCY AIRCOOLED LIQUID CHILLERS AND HEAT PUMPS WITH EC INVERTER PLUG-FANS, INVERTER SCROLL COMPRESSOR AND PLATE EXCHANGER FOR INDOOR DUCTED INSTALLATION.**



The A CLASS indoor liquid Chillers of the CRA/IK/A 21÷131 series, with R410A refrigerant and EC Inverter Plug-Fans, are designed for small and medium domestic or service sector systems with particular difficulty in positioning units outside the building.

With a pre-painted plate structure, these units can be combined with Fan Coil units or with intermediate heat exchangers for process cooling applications.

These units are equipped with particular technical and design adjustments that enable an immediate and efficient use, in addition to remarkably quiet operation and a significant useful head of the fan.

A wide range of accessories, factory fitted or supplied separately, complete the outstanding versatility and functionality of the series.

The Heat Pump version is designed for **hot water production up to 55 °C**.

**The units are compliant to the ErP Regulation.**

On request, the models 91÷131 can be supplied with **R452B (CRA/IG/A 91÷131)** or **R454B (CRA/IL/A 91÷131)** refrigerant.



**INVERTER SCROLL**

**EC INVERTER PLUG FANS**

### VERSION

**CRA/IK/A**

**CRA/IK/A/WP**

Cooling only

Reversible Heat Pump

### FEATURES

- Self-supporting pre-painted steel frame.
- DC INVERTER Scroll compressor with internal overheat protection and crankcase heater.
- High efficiency reverse blade EC INVERTER PLUG-FANS with electronic speed control.
- Condenser made of copper tubes and aluminium finned coil, complete with drain pan for WP version only.
- Evaporator AISI 316 stainless steel braze welded plates type, complete with water differential pressure switch. On the Heat Pump units it is always installed an antifreeze heater.
- Electronic expansion valve.
- R410A refrigerant. On request R452B or R454B refrigerant.
- Electrical board includes: main switch with door lock device, fuses, compressor (21÷81) and pump remote control switch.
- Condensing Control is included: electronic proportional device that ensures efficient and continuous functioning of the unit with outside air temperature down to -20 °C in cooling mode. It also allows to reduce the sound level especially at night. It consists of a fans speed controller with continuous speed regulation and high and low pressure transducers on cooling circuit.
- Functioning in heating mode with outside air temperature down to -15 °C.
- Microprocessor control and regulation system.

### ACCESSORIES

#### FACTORY FITTED ACCESSORIES

BT	Low water temperature Kit
TX	Coil with pre-coated fins
PS	Single circulating pump
FE	Antifreeze heater for evaporator

#### LOOSE ACCESSORIES

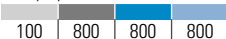
CR	Remote control panel
IS	Modbus RTU protocol, RS485 serial interface
RP	Coil protection metallic guards
AG	Rubber shock absorbers

MODEL			21	31	41	51	61	71	81	91	101	131
Cooling	Cooling capacity (1)	kW	6.0	7.6	9.3	12.4	15.7	19.0	22.4	25.8	30.5	35.9
	Absorbed power (1)	kW	1.9	2.5	3.1	4.3	5.4	6.5	7.7	9.3	10.3	12.1
	EER (1)		3.16	3.04	3.00	2.88	2.91	2.92	2.91	2.77	2.96	2.97
Cooling (EN14511)	Cooling capacity (1)	kW	6.0	7.6	9.3	12.4	15.6	18.9	22.5	25.6	30.3	35.7
	Absorbed power (1)	kW	1.9	2.5	3.1	4.3	5.4	6.5	7.7	9.4	10.5	12.3
	EER (1)		3.16	3.04	3.00	2.88	2.89	2.91	2.92	2.72	2.89	2.90
	SEER (2)		4.12	4.11	4.10	4.32	4.30	4.23	4.33	4.32	4.10	4.12
Heating	Heating capacity (3)	kW	6.7	8.8	10.9	14.1	17.5	20.9	24.8	28.7	34.3	40.4
	Absorbed power (3)	kW	2.0	2.6	3.3	4.5	5.4	6.4	7.5	9.4	10.7	12.6
	COP (3)		3.35	3.38	3.30	3.13	3.24	3.27	3.31	3.05	3.21	3.21
	Heating capacity (3)	kW	6.7	8.8	10.9	14.1	17.5	20.9	24.8	28.9	34.5	40.7
Heating (EN14511)	Absorbed power (3)	kW	2.0	2.6	3.3	4.5	5.4	6.4	7.5	9.6	10.9	12.8
	COP (3)		3.35	3.38	3.30	3.13	3.24	3.27	3.31	3.01	3.17	3.18
	SCOP (4)		3.38	3.27	3.41	3.30	3.43	3.49	3.77	3.21	3.23	3.22
	Energy Efficiency (4)	%	132	128	133	129	134	137	148	125	126	126
Compressor	Energy Class (5)		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
	Quantity	n°	1	1	1	1	1	1	1	1	1	1
Evaporator	Water flow	l/s	0.29	0.36	0.44	0.59	0.75	0.91	1.07	1.23	1.46	1.72
	Pressure drops	kPa	18	14	18	25	20	29	30	20	29	31
	Water connections	"G	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Fan available static pressure	Pa	80	80	80	115	115	115	115	115	150	150	150
Electrical characteristics	Power supply	V/Ph/Hz	230/1/50				400/3+N/50					
	Max. running current	A	17	17	17	14	14	16	19	22	22	25
	Max. starting current	A	11	11	11	9	9	10	11	12	12	13
Unit with pump	Pump available static pressure	kPa	53	56	52	76	82	70	60	140	115	150
	Water connections	"G	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Sound pressure (6)		dB(A)	52	53	54	58	58	59	60	62	63	63
Weights	Transport weight	Kg	131	136	143	203	213	215	217	353	359	374
	Operating weight	Kg	132	137	144	205	215	217	219	356	362	377

DIMENSIONS			21	31	41	51	61	71	81	91	101	131
L	STD	mm	900	900	900	900	900	900	900	1500	1500	1500
W	STD	mm	550	550	550	690	690	690	690	800	800	800
H	STD	mm	1500	1500	1500	1750	1750	1750	1750	1600	1600	1600

CLEARANCE AREA

CRA/IK/A 21÷41



CRA/IK/A 51÷81



CRA/IK/A 91÷131



NOTES

- Chilled water from 12 to 7 °C, ambient air temperature 35 °C.
- Seasonal energy efficiency of cooling at low temperature. According to EU Regulation n. 2016/2281.
- Heated water from 40 to 45 °C, ambient air temperature 7 °C d.b./6 °C w.b.
- Seasonal energy efficiency of heating at low temperature with average climatic conditions. According to EU Regulation n. 813/2013.
- Seasonal energy efficiency class of heating at low temperature with average climatic conditions. According to EU Regulation n. 811/2013.
- Sound pressure level measured in free field conditions at 1 m from the unit. According to ISO 3744.

Electrical board side